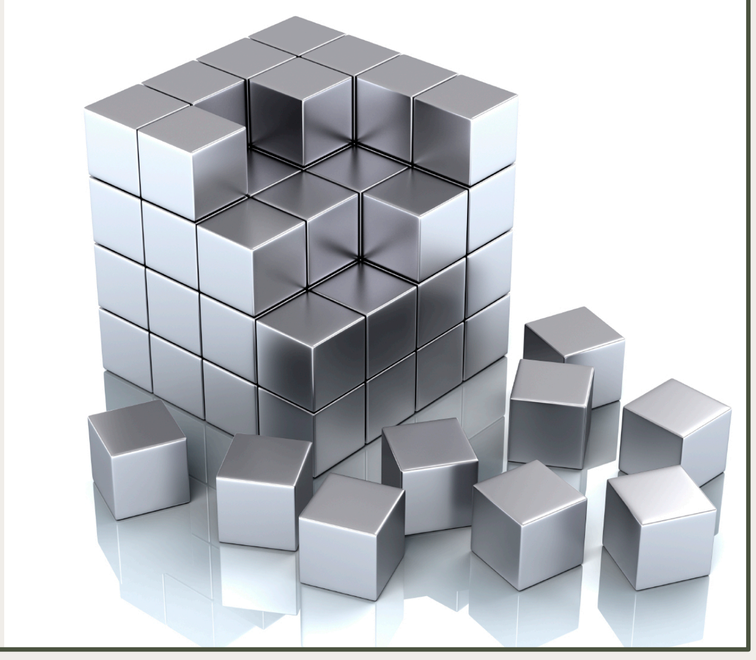
Science of Security VO

NSA Sponsors: Stuart Krohn, Heather Lucas, Brad Martin, Robert Meushaw

http://cps-vo.org/group/sos

Goals of the Science of Security Virtual Organization

The President's 2011 research plan for a trustworthy cyberspace identified a priority need for research to develop a "science of security" that would provide first principles and the fundamental building blocks for security and trustworthiness. It further recognized that the multi-dimensional nature of the problem would require contributions from biology, economics and other social and behavioral sciences in addition to the traditional disciplines of mathematics, computer science, and electrical engineering. Numerous activities have been initiated across government, academia, and industry to advance the development of such a science. This Science of Security Virtual Organization was established by the National Science Foundation to provide a focal point for security science related work and to facilitate the creation of a collaborative community to advance security science.



About Science

Security science is taken to mean a body of knowledge containing laws, axioms and provable theories relating to some aspect of system security. Security science should provide an understanding of the limits of what is possible in some security domain, by providing objective and quantifiable descriptions of security properties and behaviors. The notions embodied in security science should have broad applicability - transcending specific systems, attacks, and defensive mechanisms. The individual elements contained within security science should contribute to a general framework that supports the principled design of trustworthy systems, and may include contributions from a diverse set of disciplines including computer science, behavioral science, economics, biology, physics, and others.

Features of the SoS VO

- **Survey Current Research** - track research projects in ongoing SoS and related security research programs
- **Review Important Announcements** - get news on significant SoS-related activities
- **Find Out What's Happening** - watch for events of interest in the community Calendar
- **Connect to Others** - use chat, video conferencing, forums, and online networking
- **Share your Work** - build wikis, set up special interest groups, upload files & tools, reports, multi-media
- **Discover Resources** - search for people, papers, events, and other items of interest
- **Learn More** - take advantage of educational resources contributed by SoS members and sponsors

Current Research

- **NSA SoS Lablets**
  The Lablets are focused on the development of a Science of Security (SoS) and a broad, self-sustaining community effort to advance it.
- **NSA SoS Projects**
  - *Games and Abstraction: The Science of Cyber Security* - Dusko Pavlovic, Royal Holloway, Univ. of London
  - *GLASS: Geometric Logic for Analyzing Security with Strands* - Joshua Guttman, Worcester Polytechic Institute
  - *Making CyberSecurity Quantifiable/Refinement of HyperProperties* - Michael Clarkson, George Washington Univ.
  - *Integrity of Untrusted Computations* - Silvio Micali, MIT
- **AFOSR SoS MURI**
  The goal of this program is to provide the science foundation to enable development of advanced cyber security methods, models, and algorithms to support future Air Force systems.
- **AFOSR Trust & Suspicion BRI**
  This MURI's objective is to initiate a basic research program that begins to build the foundational understanding of human trust and suspicion in the cyberspace domain.
- **NSF TRUST Center**
  TRUST is focused on the development of cyber security science and technology that will radically transform the ability of organizations to design, build, and operate trustworthy information systems for the nation's critical infrastructure.

SoS Background Material

Recommendations for Science of Security background reading:

- *Trustworthy Cyberspace: Strategic Plan for the Federal Cybersecurity Research and Development Program*
- Final Report: 2008 Berkeley SoS Workshop
- The Next Wave: *Developing a Blueprint for a Science of Cybersecurity* Spring 2012
- *Blueprint for a Science of Cybersecurity*, Fred B. Schneider
- *The Science of Security*, Security & Privacy May/June 2011
- *"Measuring Security", IEEE Security & Privacy, May/June 2011*, Stolfo, Bellovin, Evans
- Science of Cyber-Security Study, Kickoff Meeting
- Science of Cyber-Security, JASON report, 2010

Other Science Related reading:

- *Strong Inference*, John R. Platt
- The Sciences of the Artificial excerpt (2nd Ed. 1981, pp 129-159), Herbert A. Simon
- *DHS Roadmap for Cybersecurity Research*
- *Schneider on Security*, Fred B. Schneider

Science of Security Community Meeting
Nov. 29-30, 2012
National Harbor, MD